800 SERIES
SERVICE MANUAL

40,000 – 58,000 LB

PART# EDOC001

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1.0 GENERAL INFORMATION

This manual is to be used for the service of a Chalmers 800 Series Tandem Suspension and is intended to give guidance and recommendation for the care, maintenance, inspection and safe operation of the above suspension. It is not a replacement for existing or future specific Pre-Delivery Inspection (P.D.I.) & Preventative Maintenance Programs.

Before proceeding with any work on or with the suspension, please read this manual completely to familiarize yourself with the maintenance and operation of the Chalmers Suspension.

TAKE SPECIAL NOTICE of procedures 1.1 through 1.6 that must be followed without exception when working on any procedures described in this manual.

1.1 ALL CHALMERS FASTENERS must be torqued to the specific values shown in Table 2 and to the specific period shown on the Service Inspection Requirements Section 3.0.

**IMPORTANT – Failure to check torque, may lead to fastener failure and consequent loss of vehicle control and void warranty.

1.2 DO NOT USE ANY mineral based oils, greases, jellies, or solvent soaps as a lubricant to aid in the assembly of the rubber bushed torque rods. Use only quality rubber lubricants. Failure to do so will void warranty.

1.3 DO NOT AT ANY TIME WORK AROUND OR UNDER A VEHICLE SUPPORTED ONLY ON LIFTING DEVICES. THE VEHICLE MUST BE SECURELY CHOCKED AND SUPPORTED ON RIGID STANDS BEFORE WORK MAY COMMENCE.

1.4 ALL RELEVANT, MACHINERY, TOOL AND WORK PLACE SAFETY procedures and instructions must be followed without exception when working on any procedures described in this manual.

<u>FAILURE TO ADHERE TO ANY SAFETY PROCEDURES OR INSTRUCTIONS, MAY LEAD TO PERSONAL INJURY.</u>

1.5 USE ONLY CHALMERS APPROVED REPLACEMENT PARTS. Tests have shown alternate parts, particularly torque rod bushings, do not meet the performance expectations or engineering criteria established for the original products. This has created extreme hard part wear or hardware failures with consequent loss of warranty and more important loss of vehicle control.

1.6 DO NOT operate the vehicle with the suspension in an over loaded condition. Operating at a gross rear axle weight (GRAW), which exceeds the rated suspension capacity will lead to a suspension failure with consequent loss of vehicle control and void warranty.

2.0 INTRODUCTION TO THE SUSPENSION

The Chalmers 800 Series Rear Suspension is a walking beam-type tandem axle suspension that uses hollow rubber springs instead of leaf springs or air bags. Each hollow rubber spring is mounted between a frame-rail plate and the centre (front-to-rear) of the steel walking beam. A sawhorse bracket assembly is attached to the frame and provides mounting points for the lower torque rods that tie the axles to the frame. The upper torque rods are fastened to brackets that bolt to the frame side rails and to tower assemblies that are welded to the top of the differential housings. See Fig.1.

The 800 Series Rear Suspension allows a high degree of both parallel and diagonal articulation, while maintaining wheel load equalization to within 3%.

The Chalmers suspension design separates the rear suspension's responsibility for supporting/cushioning the load from that of locating/guiding the axles. The suspension is very light, relative to its load carrying capacity and requires very little maintenance. In fact, there are no lubrication fittings since grease and oil are never needed.

The 800 Series is also available in three different axle spacings: 54-inch, 60-inch and 72-inch axle-to-axle. The axle-to-axle spacing dimension is included as part of the suspension name, e.g. "Chalmers 854 Suspension" or "Chalmers 860 Suspension."

Shock absorbers are optional on all versions of the suspension, and available in two styles – beam mounted and axle housing mounted.

The rear suspension may be precision-aligned by adjusting the length of the lower torque rods. These rods have both left and right hand threads cut on the same tube so rotating the tube changes the effective length of the tube.

2.1 SUSPENSION PART NAMES

Fig.1 shows an exploded view of a typical 800 Series Suspension.

Throughout this manual, parts will be referred to by the names shown on this figure.

SUSPENSION NOMENCLATURE

ITEM	DESCRIPTION
1	TRIANGULAR FRAME
2	BEAM
3	BEAM SPRING PLATE
4	#20 LOADGUARD SPRING
5	#28 RESTRICTOR CAN
6	UPPER TORQUE ROD
7	LOWER T/ROD FIXED
8	LOWER T/ROD ADJUSTABLE
9	LOWER T/ROD FIXED
10	LOWER T/ROD ADJUSTABLE
11	TORQUE ROD FRAME BRKTS
12	SPIGOT CAP #1 JOINT
13	TORQUE ROD BUSHING
14	TOWER PLUG
15	UPPER SHOCK BRACKET
16	SHOCK ABS/REBOUND STOP
17	TOWER FORWARD
18	TOWER REAR
19	SADDLE LOW
20	SADDLE HIGH
21	TORQUE ROD BRKT- LHF/RHR
22	TORQUE ROD BRKT- RHF/LHR
23	HEX CAP BOLT, FLGD
24	STOVER LOCKNUT, FLGD
25	HEX CAP BOLT, FLGD
26	STOVER LOCKNUT, FLGD
27	HEX CAP BOLT, FLGD
28	STOVER LOCKNUT, FLGD

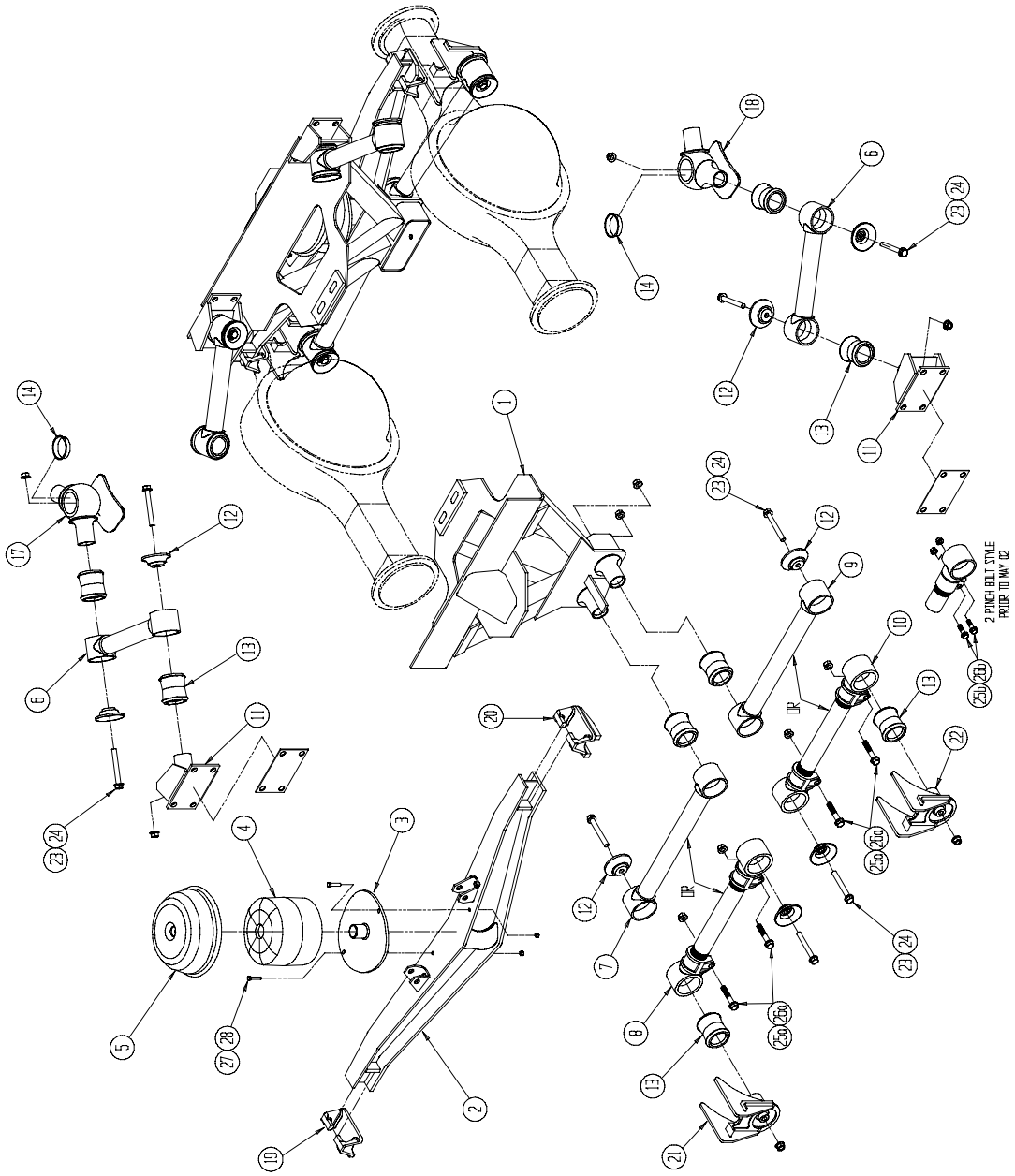


FIGURE 1

3.0 SERVICE – INSPECTION REQUIREMENTS

The Chalmers 800 Series Suspension was designed to require minimum general maintenance. The recommendations shown on the following chart are precautionary and are aimed at avoiding future problems.

PART	ACTION	P.D.I.	1000 Mile 1600 KM	DLY	MTH	YRLY
All Hardware	Check torque to values shown on Table 2.	•	•			•
	On the daily walk around Visually inspect for looseness.			•		
Torque Rod Bushing	Wear check. See Section 4.2 for guidelines.				•	
	Visually inspect for tears or cracks.				•	
	Visually inspect for correct installation. See Sections 4.2 & 4.3 for guidelines.	•	•			
Restrictor Can	Visually inspect for wear or cracking. Replace as required. See Sections 4.4 & 4.5 for guidelines.				•	
	Visually inspect for missing cans, and cans not centered on spring.	•				
Spigot Cap	On the daily walk around visually inspect for missing, cracked, broken or loose caps. Replace as required or retorque. See Sections 4.6 & 4.7 and Table 3 for guidelines.	•	•	•		

PART	ACTION	P.D.I.	1000 Mile 1600 KM	DLY	MTH	YRLY
OPTIONAL Shock Absorber (if fitted)	Visually inspect for leaks, cylinder damage or worn rubber end bushings. Verify inspection schedules. See Sections 4.8 & 4.9 for guidelines				•	•
Walking Beam	Inspect for wear and cracks. See Sections 4.10 & 4.11 for guidelines. Inspect for beam free float in axle saddles, 1.25" (32mm) fore and aft. .25" (6mm) side to side. See Section 4.10.	•				•
Axle Bracket, Triangular Frame	Visually inspect for road damage or cracks. Replace any damaged parts as required. Contact Chalmers for guidelines.		•			•
Rubber Spring	Visually inspect for chemical damage, deep tears and deformed springs. Replace as required. See sections 4.12 & 4.13 for guidelines. Visually inspect that the spring is sitting centrally on the spring plate and is seated down fully.	•	•		•	

NOTICE:
The above chart was developed from Chalmers experience on parts subject to wear in normal service. The wear rate is dependent on a number of factors such a load carried, speed travelled, roadbed conditions, traffic density and number of stops.

NOTE:
IF THE OPERATOR OF THE VEHICLE IS IN ANY DOUBT ABOUT THE SAFETY OF THE SUSPENSION, HE SHOULD NOT OPERATE THE VEHICLE AND SHOULD IMMEDIATELY SEEK QUALIFIED ADVICE.

4.0 GUIDELINES TO THE INSPECTION AND REPLACEMENT OF SERVICE PARTS

Recommended tools needed to carry out the work covered in Section 4.1 through 4.13.

TOOL LIST

Open End Wrench: 9/16", 3/4", 15/16", 1-1/8", 1-5/16"

Box Wrench (Offset Preferred): 9/16", 3/4", 15/16", 1-1/8", 1-5/16".

Standard Socket (1/2" Drive): 9/16", 3/4", 15/16", 1-1/8", 1-5/16".

Extra Deep Socket (1/2" Drive): 15/16".

Impact Socket (1/2" Drive): 9/16", 3/4", 15/16", 1-1/8", 1-5/16".

Extra Deep Impact Socket (1/2" Drive): 15/16".

Torque Wrench (1/2" Drive): 25 – 250 Ft. Lbs. (CALIBRATED)

GENERAL TOOLS

Socket Drive Ratchet (1/2" Drive)

Heavy Mallet (Rubber, Copper or Hide)

2 lbs. Copper/Hide Hammer

Large (12" Long Min.) Square Blade Screwdriver

Pinch or Wrecking Bar (3/4" size)

Tape Measure (16 ft.)

Vernier Caliper (6.0" Reading .001")

Impact Wrench (1/2" Drive)

Bottle Jack (5 ton)

Wheel Chocks

Various Wooden Blocks

LUBRICANTS

Rubber Lubricant: Rimslip or equivalent
Important – Do not use oil or grease.

4.1 FASTENERS

This guideline is to be used for the inspection or replacement of Chalmers supplied fasteners ONLY. Not supplied by Chalmers are the fasteners attaching the triangular frames and upper frame brackets to the vehicle frame. For inspection and specification on these, please refer to the vehicle manufacturer.

The fastener systems used in a Chalmers suspension are the key to the care and safe operation of the suspension.

These systems comprise of an SAE GR.8 flanged head bolt and SAE GR.G flanged head "Stover" locknut. The sizes of these systems have been specifically engineered for each of their positions and functions within the suspension. See the following Table 1 for size and function.

TABLE 1

SIZE	CAPACITY	FUNCTIONS
7/8" Dia.	46,000 to 58,000	Shock Absorber Option Frame to Axle
3/4" Dia.	40,000 to 58,000	Shock Absorber Option Frame to Beam
5/8" Dia.	40,000 to 58,000	ALL Torque Rod Joints & Torque Rod Eye Pinch Bolts*
1/2" Dia.	40,000	Torque Rod Eye Pinch Bolts **
3/8" Dia.	40,000 to 58,000	ALL Spring Plates To Beams

* Single pinch bolt style
** Double pinch bolt style

For the safety and proper operation of the suspensions **ALL FASTENERS MUST**, using a calibrated torque wrench, be initially torqued and retorqued at 1000 miles/1600 km of service, to the specific values shown on Table 2.

TABLE 2 Torque Specifications
For Bolts and Locknuts provided by Chalmers

BOLT SIZE	ASSEMBLY TORQUE FT. LBS.
3/8”	35
1/2"	65
5/8”	135
3/4”	170*
7/8”	170*

* Values for shock installation only. For all other uses contact Chalmers Suspensions.

The above torques are recommended for Chalmers-supplied hardware only, and are NOT intended for hardware supplied by others.

NOTE: Re-torque must be done to both original and replacement fasteners.

IMPORTANT: For fastener replacement use **ONLY NEW CHALMERS** approved fasteners. **DO NOT RE-USE or use other fasteners.** To do so may lead to fastener failure and consequent loss of vehicle control.

IMPORTANT: **FAILURE TO CHECK TORQUE MAY LEAD TO FASTENER FAILURE AND CONSEQUENT LOSS OF VEHICLE CONTROL.**

4.2 TORQUE ROD BUSHING INSPECTION.

All 800 Series Suspensions incorporate rubber bushed torque rod joints that isolate the vehicle from axle braking and driving shocks. To accommodate the full range of suspension capacities, Chalmers has two sizes of bushing. See Fig.2 for details. Both bushings are similar and they both absorb axle shock by compression. This compression may give a false impression of a worn bushing. To reduce the chances of prematurely replacing a good bushing, the following steps should be used when inspecting all Chalmers bushings:

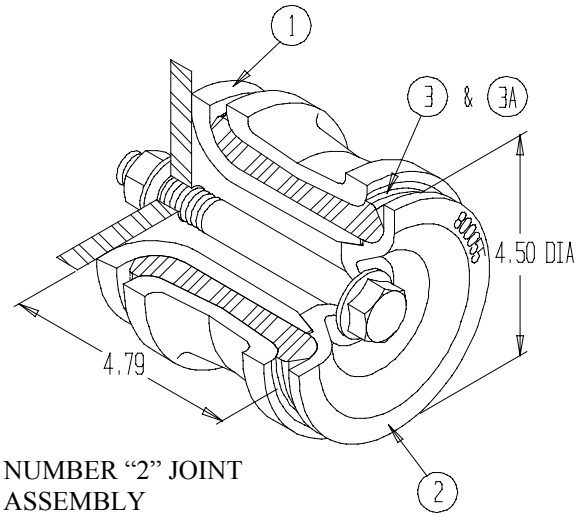
STEP 1 - If possible power wash the torque rod ends. As a minimum, the ends should be brushed with a hard bristle brush to remove road dirt accumulations so that the rubber bushing may be seen.

STEP 2 – Chock the front tires to prevent the vehicle from moving. Remove all drive axle brake or wind up loads by placing transmission in neutral, releasing spring brakes, or driveline brake.

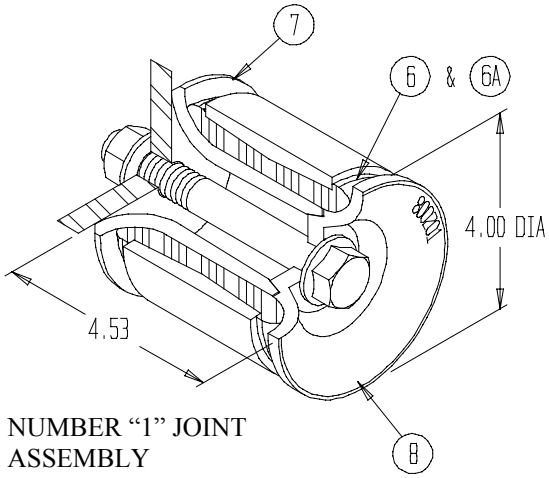
STEP 3 – **USING HANDS ONLY** attempt to move the torque rod ends, checking for **FREE** play. If free play is felt, the bushing should be replaced. (If in doubt contact Chalmers).

NOTE: DO NOT USE A PRY BAR OR LEVER to check for free play. To do so may lead to premature bushing replacement.

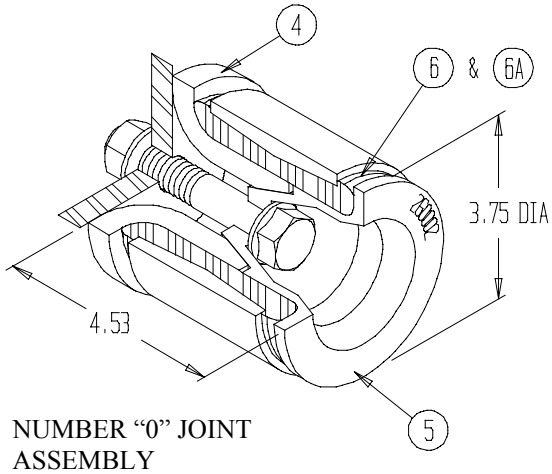
SPIGOT JOINTS



NUMBER "2" JOINT ASSEMBLY



NUMBER "1" JOINT ASSEMBLY



NUMBER "0" JOINT ASSEMBLY

Item	Part No.	Description
1	800021	Spigot Base #2 Joint
2	800055	Spigot Cap #2 Joint
3	800010	T/Rod Bushing #2 Joint
* 3A	800009	T/Rod Bushing-Oversize #2 Joint
4	700096	Spigot Base #0 Joint
5	260002	Spigot Cap #0 Joint
6	22128	T/Rod Bushing #0 & #1 Joint
* 6A	22129	T/Rod Bushing-Oversize #0 & #1 Joint
7	800200	Spigot Base #1 Joint
8	800201	Spigot Cap #1 Joint

* Service Bushing

#2 Joint
800 Series Tandem Truck 46-58,000 lbs. Capacity
#1 Joint
800 Series Tandem Truck 40,000 lbs. Capacity – as of Jan 01/93
#0 Joint
800 Series Tandem Truck 40,000 lbs. Capacity – prior to Jan 01/93

FIGURE 2

4.3 TORQUE ROD BUSHING REPLACEMENT

Replacement of Chalmers Torque Rod Bushings may be achieved easily and quickly in any shop without the use of a press or special tools, using the following steps as a guide.

STEP 1 – If possible power wash the torque rod ends, as a minimum, the ends should be brushed with a hard bristle brush to remove road dirt accumulations.

STEP 2 – Chock the front tires to prevent the vehicle from moving. Remove all drive axle brake or wind up loads by placing transmission in neutral and releasing the spring or driveline brakes.

STEP 3 – Lift the rear of the vehicle. Support the frame on stands so all weight is just taken off the suspension.

NOTE: All stands and lifting devices **MUST** be of sufficient strength and rigidity to safely support the vehicle. **DO NOT WORK AROUND OR UNDER THE VEHICLE WHEN SUPPORTED ON LIFTING DEVICES.**

STEP 4 – Work on only one torque rod at a time. Remove the 5/8" NC joint fasteners and spigot caps. Discard the fasteners, keep the spigot caps for inspection and cleaning. Remove the torque rod from the spigots by prying at each end until it comes free of the spigots.

NOTE: On the axle towers, pry off the tower plug cap to access the joint nuts. Keep the plug cap.

NOTE: By completely removing and re-fitting only one torque rod at a time the chance of torque rod mix-up, which could lead to re-alignment of the suspension, or loss of axle planning angle and consequent axle damage, will be eliminated.

STEP 5 – Place the torque rod on a bench or the floor with the bushing end facing up. Remove the bushings by inserting the tip of a large screwdriver down between the bushing and the torque rod eye and prying out. Discard the bushing.

STEP 6 – Using a wire brush and/or scraper clean all rust, scale and rubber accumulations from the spigots, torque rod eyes and spigot cap, taking particular care to clean the inside taper of the spigots.

STEP 7 – Inspect the torque rod eyes, spigots and spigot caps for visual cracks and wear.

Should any of the following parts show visual cracks, the part **MUST** be discarded and replaced:

- Torque Rod and Eye
- Spigot Cap

Should the spigot show visual cracks, contact Chalmers for guidelines.

For wear limits, refer to Table 6 and Appendix "A" Service Bulletin Re: Part No. 260002. Chalmers allows for wear in its design by providing oversize replacement bushings for the 40,000 lb. and 46,000 to 58,000 lb. Suspensions. Refer to Table 6 for when to use.

STEP 8 – Liberally lubricate the inside diameter of the torque rod eye, and the outside diameter of the replacement rubber bushing with a quality rubber lubricant such as Rimslip or equivalent.

IMPORTANT: Never use any mineral based oils, greases, jellies or solvent soaps as a lubricant. To do so will lead to the premature failure of the bushing.

Place the torque rod on a solid level floor with the open eye end up. Place a rubber bushing onto the eye so as the outside tapered end of the bushing just enters the eye. Try to make sure the bushing is as even as possible to the eye. With a heavy, soft-faced mallet, quickly strike the bushing to drive it down into the eye. See Fig.3.

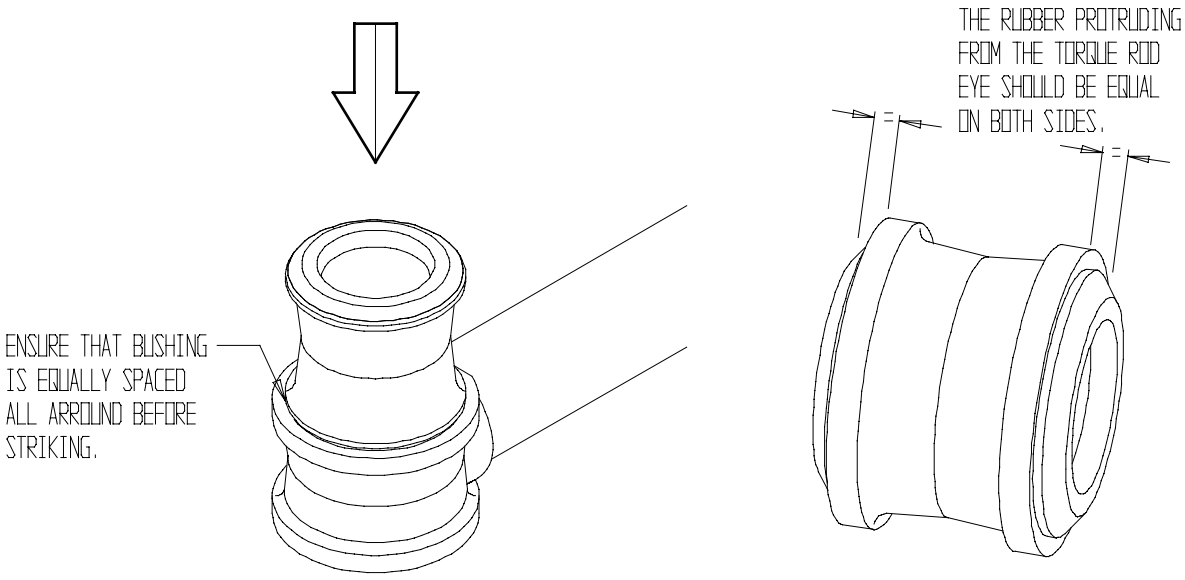

ENSURE THAT BUSHING IS EQUALLY SPACED ALL ARROUND BEFORE STRIKING.
THE RUBBER PROTRUDING FROM THE TORQUE ROD EYE SHOULD BE EQUAL ON BOTH SIDES.

FIGURE 3

NOTE: Repeat the above procedure for the 2nd bushing. Then, flip the torque rod over 180 degrees. Tap with a mallet to drive the bushings completely through the eyes until they are positioned evenly in the eyes. See Fig.3.

STEP 9 – Liberally lubricate the torque rod rubber bushings and the relevant spigots with a quality rubber lubricant.

IMPORTANT: Never use any mineral based oils, greases, jellies or solvent soaps as a lubricant to aid in the assembly of the rubber bushed torque rods. To do so will lead to the premature failure of the bushing.

STEP 10 – Push each end of the torque rod onto its relevant spigot. Using a heavy soft-faced mallet, drive the toque rod onto the spigots. For best results, alternate end to end driving so as the torque rod bushings travel evenly over the spigots. Continue driving until the bushing contacts the spigot bottom face.

STEP 11 – Press the spigot caps into the ends of the torque rod bushings, secure the ends in place using new 5/8" NC fasteners.

Torque the 5/8" NC fasteners to 135 ft. lbs. See Table 2.

****IMPORTANT**: Failure to check torque may lead to fastener failure and consequent loss of vehicle control and void warranty.

Repeat Steps 1 through 11 for each torque rod to complete the suspension rebushing.

IMPORTANT: USE ONLY NEW CHALMERS approved 5/8" NC fasteners for the joints. DO NOT RE-USE or use other fasteners. To do so may lead to fastener failure and consequent loss of vehicle control and void warranty.

When finished rebushing, check to see if the torque rods have been replaced as per Fig.4.

The 46,000 to 58,000 lbs. Suspension upper rods must be oriented as shown in Fig.4.

TORQUE ROD INSTALLATION

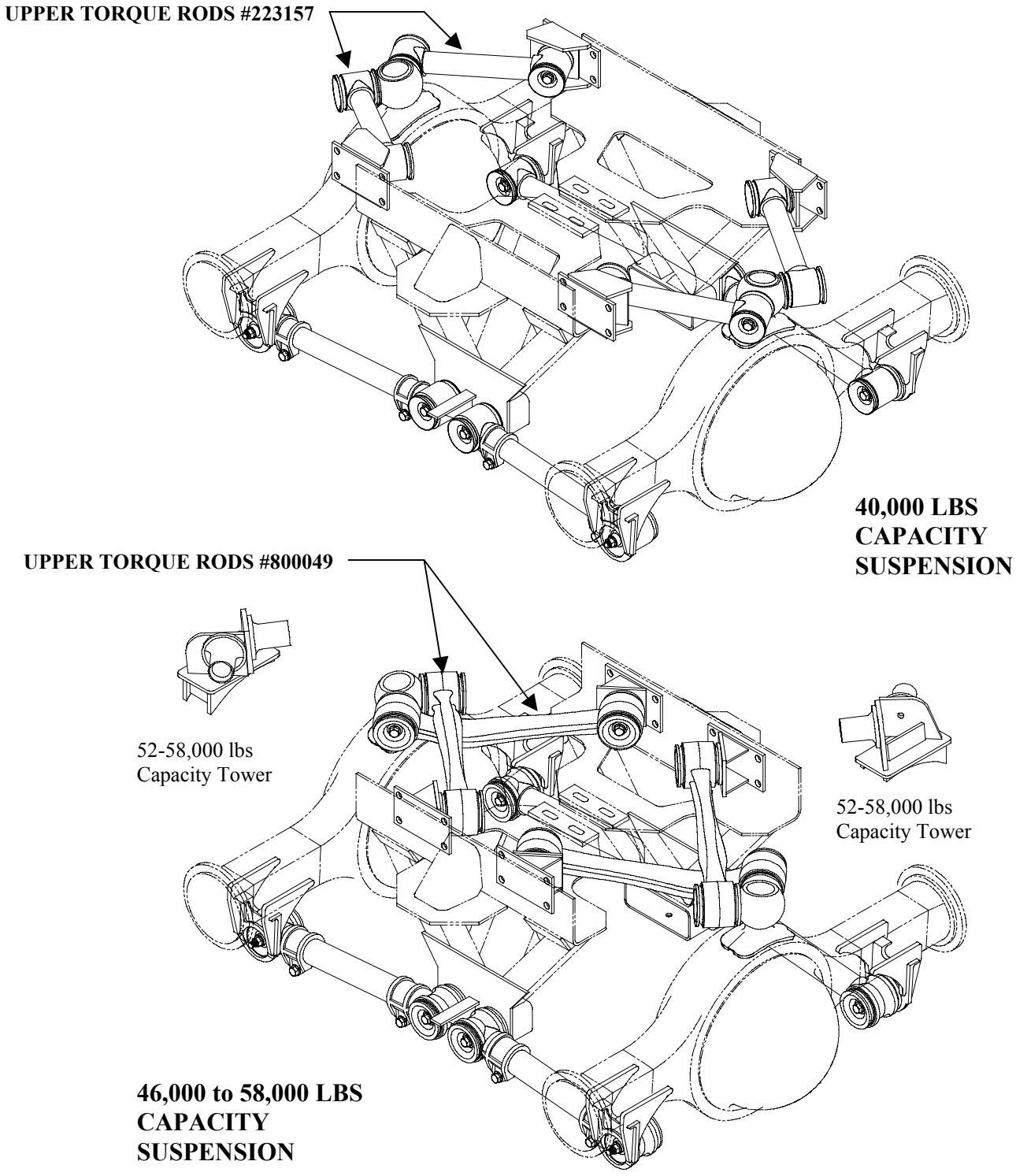


FIGURE 4

4.4 RESTRICTOR CAN INSPECTION

The Chalmers spring system comprises of a rubber spring and an enclosing metal restrictor can. The purpose of the restrictor can is to provide specific ride, road handling characteristics and protection to the spring.

To accommodate the different road handling conditions that may be encountered, Chalmers produces a number of different sized restrictor cans. Refer to Appendix "B", Technical Sales Bulletin No. 15 for application guidelines.

The free floating design of the Chalmers spring and beam, requires that the restrictor can be free to move on the vehicle frame. The restrictor can will wear or corrode over a period of time and will require replacement. Carefully inspect the restrictor can for cracks or severe corrosion, using the following steps as a guideline:

STEP 1 – If possible, power wash the restrictor can spring area. As a minimum, brush the area with a hard bristle brush to remove road dirt accumulations.

STEP 2 – Chock the front tires to prevent the vehicle from moving. Lift the rear of the vehicle, support the frame on stands so that all weight is just taken off the suspension.

NOTE: All stands and lifting devices, MUST be of sufficient strength and rigidity to safely support the vehicle. DO NOT WORK AROUND OR UNDER THE VEHICLE WHEN SUPPORTED ON LIFTING DEVICES.

STEP 3 – Rotate the restrictor can completely around, looking at the top and sides for visual cracks and signs of severe corrosion or distortion. If any of these are present, or the restrictor can is missing, it should be replaced. It is recommended that both restrictor cans be replaced to assure evenness of ride and handling.

NOTE: Should a cracked or missing restrictor can be found during vehicle operation, it may be driven SLOWLY to the nearest maintenance shop for replacement.

ALL CRACKED OR MISSING restrictor cans MUST be replaced. Failure to do so may lead to loss of vehicle control and consequent personal injury.

4.5 RESTRICTOR CAN REPLACEMENT

Replacement of Chalmers restrictor cans may be achieved easily and quickly in any shop without the use of special tools, using the following steps as a guide.

STEP 1 – If possible, power wash the restrictor can spring area. As a minimum, brush the area with a hard bristle brush to remove road dirt accumulations.

STEP 2 – Chock the front tires to prevent the vehicle from moving. Lift the rear of the vehicle, support the frame on stands so as all weight is just taken off the suspension.

NOTE: All stands and lifting devices MUST be of sufficient strength and rigidity to safely support the vehicle. DO NOT WORK AROUND OR UNDER THE VEHICLE WHEN SUPPORTED ON LIFTING DEVICES.

STEP 3 – Remove the two 3/8" NC fasteners holding the lower spring plate to the beam. Discard the fasteners.

NOTE: On 54.0" spread suspensions, it may be necessary to remove either the front or rear tires to allow spring assembly removal.

STEP 4 – Pull the lower spring plate, spring and restrictor can as one assembly outward off the beam. See Fig.5.

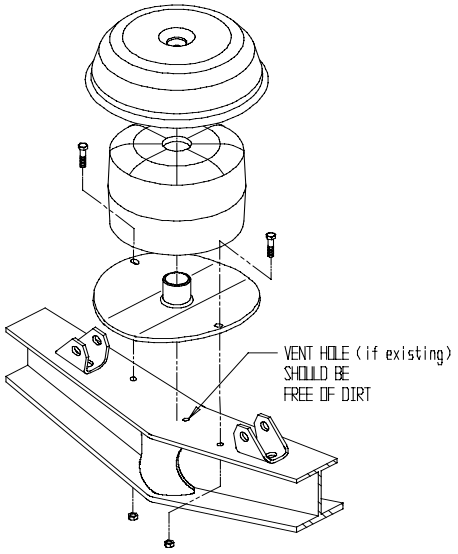


FIGURE 5

STEP 5 – Separate the restrictor can, spring and lower spring plate. Discard the restrictor can. Using a wire brush or scraper, remove rust and road accumulations from the spring plate. Clean out the centre vent holes in the beam and lower spring plate. See Fig.5. Inspect the lower spring plate for visual cracks. If cracked, replace. Contact Chalmers for details.

STEP 6 – Turn the spring upside down so as the old top is now down. Place on lower spring plate, inserting the spring dowel into the centre spring hole. Place the replacement restrictor can over the spring. Make sure the can centre locator is in the centre spring hole. See Fig.5.

STEP 7 – Lift and place as one assembly, the lower spring plate, spring and restrictor can onto the beam. Line up the 3/8" fastener holes.

STEP 8 – Install and tighten the new 3/8" NC spring plate fasteners. Torque to 35 ft. lbs. See Table 2.

STEP 9 – Repeat Steps 3 through 8 to complete. Before removing vehicle from stands, check both restrictor cans for an even gap around the spring. Adjust if required.

4.6 SPIGOT CAP INSPECTION

The spigot caps are part of the Chalmers torque rod joint system and play a key part in this system by placing a small amount of end compression to the rubber bushing and providing end retention to the joint.

Two sizes of torque joints are used in the Chalmers 800 Series Suspension. The suspension capacity and spigot caps used are shown in the following Table 3.

TABLE 3

JOINT SIZE	CAPACITY	SPIGOT CAP NO.	BUSHING	
			O.E.M	SERVICE
AFTER JAN/93 #1	40,000 lbs.	800201	22128	22129
#2	46,000 lbs. 58,000 lbs.	800055	800010	800009
BEFORE JAN/93 #0	36,000 lbs. 40,000 lbs.	260002 Spare Part Only		22129

NOTE: Torque Rod Joint #1 superseded Joint #0 on all 40,000 lbs. 800 Series Suspensions built starting January 1993.

All 40,000 lbs. 800 Series Suspension built before January 1993 have #0 Joints and Spigot Cap #260002. (Check for Part No. on Spigot Cap. See Fig. 2.)

Spigot Caps 800201 and 260002 are not interchangeable. See Fig.2.

Visual inspection of the spigot caps should be done on a daily basis. See Section 3.0 Service Inspection Requirements.

IMPORTANT: If a missing, cracked or broken spigot cap is detected, it MUST be replaced immediately. DO NOT operate the vehicle. To do so may lead to consequent loss of vehicle control and personal injury.

IMPORTANT: If a loose spigot cap is found, retorque the 5/8" NC fasteners to 135 ft. lbs. See Table 2. Should persistent loosening occur, replace the 5/8" NC fastener as hard part wear is affecting the bolt seat. See Table 2, and Appendix "A" Service Bulletin Re: Part No. 260002.

4.7 SPIGOT CAP REPLACEMENT

Replacement of the spigot caps may be achieved easily and quickly with no requirements to remove major parts from the vehicle or use special tools, using the following steps as a guide.

STEP 1 – If possible power wash the torque rod ends. As a minimum, the ends should be brushed with a hard bristle brush to remove road dirt accumulations.

STEP 2 – Chock the front tires to prevent the vehicle from moving. Remove all drive axle brake or wind up loads by placing transmission in neutral and releasing, the spring or driveline brakes.

NOTE: On the axle tower, pry off the tower plug cap to access the joint nuts. Reinstall the cap when spigot cap replacement is finished.

STEP 3 – Remove the 5/8" NC fasteners and pry off the spigot cap, discard both.

STEP 4 – Press the replacement spigot cap into the ends of the torque rod bushings.

STEP 5 – Install and tighten new 5/8" NC torque rod joint fasteners. Torque to 135 ft. lbs. See Table 2.

IMPORTANT: Failure to check torque may lead to fastener failure and consequent loss of vehicle control and void warranty.

4.8 SHOCK ABSORBER INSPECTION

Shock absorbers are provided on the 800 Series Suspension as an option to provide specific ride properties for different road conditions. The 800 Series Suspension may be fitted with either beam-mounted or axle mounted shock absorbers. See Fig.6 and Fig.7. The replacement procedure is essentially the same for both types of shock absorbers.

NOTE: ONLY ONE TYPE OF KIT SHOULD BE FITTED TO THE SUSPENSION. AN OVERLY STIFF RIDE MAY RESULT IF BOTH TYPES ARE USED ON THE SAME SUSPENSION.

Shock absorber No. **665174**, **800781** or **800670** should be visually inspected on a monthly basis. See Section 3.0 Service Inspection Requirements. If a leaking, road damaged, badly corroded, or shock with worn rubber end bushings is found, it should be replaced as soon as possible.

NOTE: Should a leaking or damaged shock absorber be found during vehicle operation, the shock absorber should be removed immediately. See Section 4.9 Shock Replacement Steps 1 to 5, or the vehicle may be driven SLOWLY to the nearest maintenance shop for either removal or replacement.

4.9 SHOCK ABSORBER REPLACEMENT

Refer to Fig.6 or Fig.7 to determine which shock absorber option is fitted to your vehicle.

For replacement of beam-mounted shock absorber #**665174**, the following steps may be used as a guideline:

STEP 1 – Chock the front tires and set the park brake to prevent the vehicle from moving.

STEP 2 – Remove the top and bottom ¾" NC fasteners from the shock absorbers. Pull the shock absorber from the bottom beam shock bracket. Discard the fasteners and shock absorber.

STEP 3 – Place the bottom eye of the replacement shock absorber into the beam bracket. Refer to Fig.6. Install and tighten NEW ¾" NC fasteners and hardened washers.

STEP 4 – Adjust the shock absorber length so as the top eye lines up with the hole in the upper shock bracket. Install and tighten NEW ¾" NC fasteners and hardened washers.

STEP 5 – Torque the ¾" NC fasteners to 170 ft. lbs. See Table 2.

For replacement of shock absorbers #**800781** or **800670,** the following steps may be used as a guideline:

STEP 1 – Chock the front tires and set the park brake to prevent the vehicle from moving.

STEP 2 – Remove the top and bottom 7/8" NC locknuts from the shock absorber. Pull the shock absorber from the top and bottom shock brackets. Discard the locknuts and shock absorber.

STEP 3 – Carefully clean and relubricate the top and bottom shock absorber bracket threads. Referring to Fig.7 install the replacement shock absorber onto the top and bottom shock brackets. Install and tighten NEW 7/8" NC locknuts and hardened washers.

STEP 4 – Torque the 7/8" NC fasteners to 170 ft. lbs. See Table 2.

IMPORTANT:
FAILURE TO CHECK TORQUE MAY LEAD TO FASTENER FAILURE WITH CONSEQUENT PREMATURE FAILURE OF THE SHOCK ABSORBERS.

SHOCK ABSORBER (BEAM) INSTALLATION
FOR SHOCK ABSORBER NO. 665174

ITEM	DESCRIPTION	QTY.
1	SHOCK ABSORBER	4
2	SHOCK BRACKET	4
3	HEX CAP BOLT	4
4	HEX CAP BOLT	4
5	STOVER LOCKNUT	8
6	WASHER	8

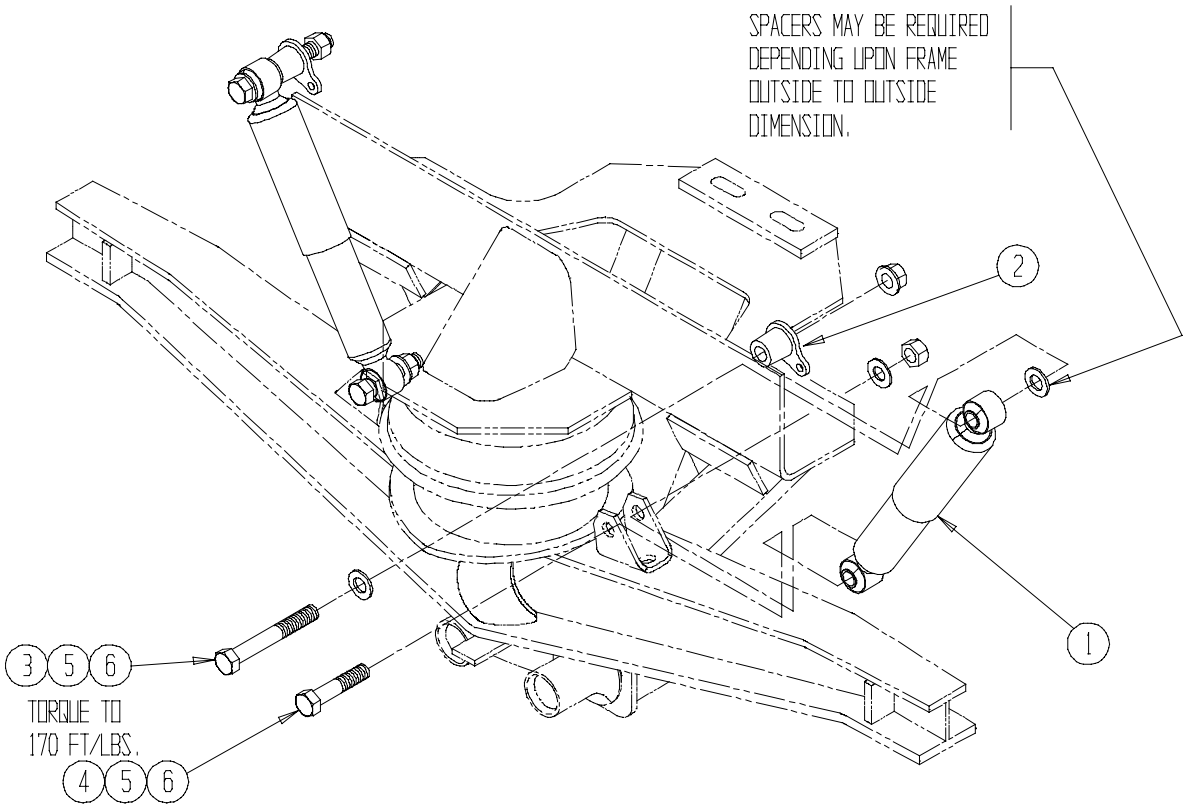


FIGURE 6

SHOCK ABSORBER (AXLE) INSTALLATION
FOR SHOCK ABSORBER NO. 800670/800781

ITEM	DESCRIPTION	QTY.
1	UPPER SHOCK BRACKET	2
2	SHOCK ABSORBER	2
3	RH LOWER SHOCK BRKT	1
4	LH LOWER SHOCK BRKT	1
5	HARDENED WASHER	4
6	HEX LOCKNUT "STOVER"	4
7	COMPRESSION SLEEVE	4

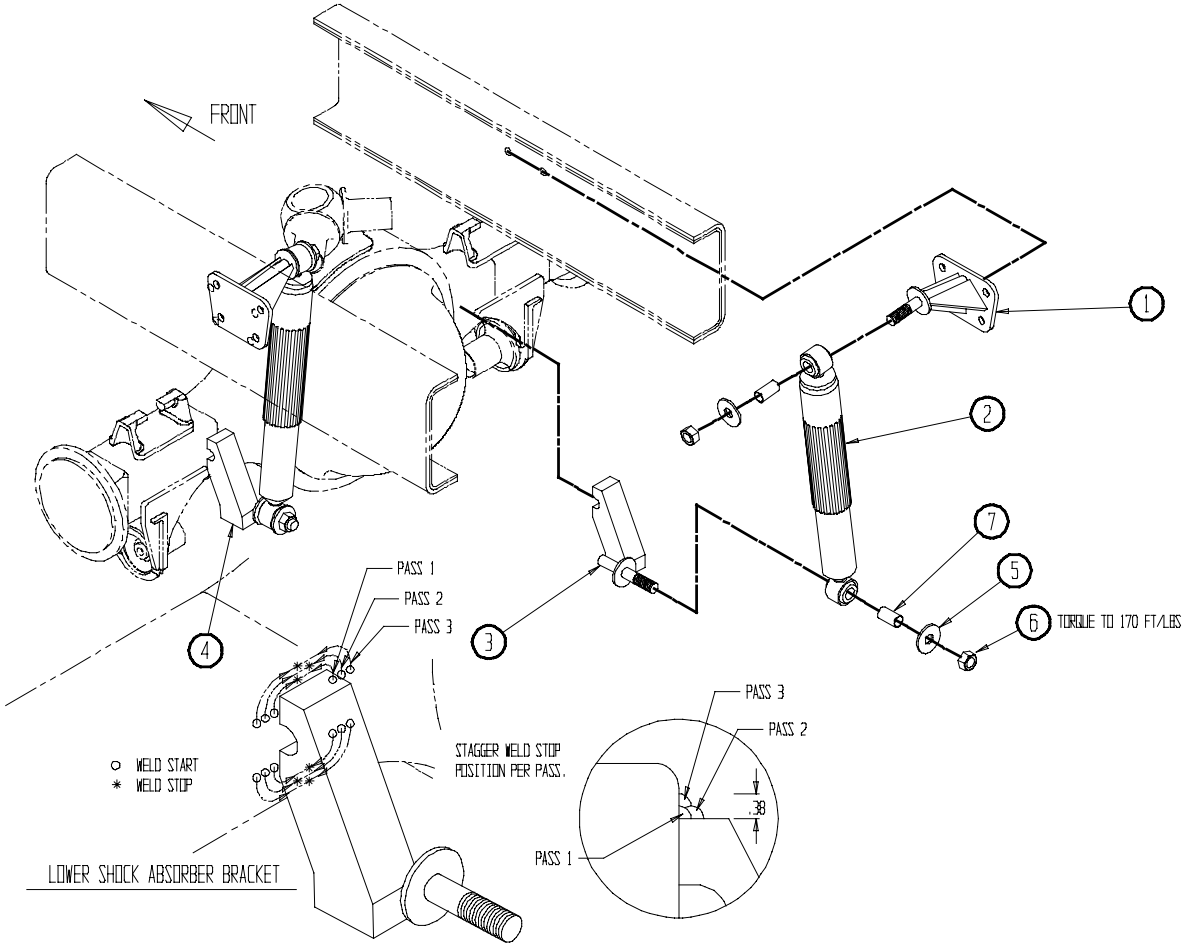


FIGURE 7

4.10 WALKING BEAM INSPECTION

The Chalmers 800 Series Walking Beam is a key part of the load support and equalization system of the suspension. It not only acts as a lower support and anchor point for the spring system, but also provides the means to equally share the vehicle load to the axles.

To allow the high articulation that the 800 Series Suspension provides, the walking beams MUST be free to move a total of 1.25" (32mm.) fore and aft, and .25" (6 mm.) side to side when the vehicle is on level ground and loaded.

The walking beams have two wear points, at the contact between the beam-ends and axle saddles. The rate of wear at these points will vary depending on the operating conditions, axle loading, and distance travelled.

Chalmers recommends inspecting the beams for end wear and cracks at the intervals shown in Section 3.0 Service Inspection Requirements.

Inspect the beam-ends carefully, looking for cracks and lower flange wear. Cracks along welds may be repairable while cracks in or across the beam flanges require walking beam replacement. See Fig. 1 Appendix "D" Engineering Bulletin 8905. Lower flange wear requires the accurate measurement of lower beam flange thickness. Measurements taken at the flange edges are not an accurate indication of beam wear, see Fig.8, and may lead to unnecessary beam repair/replacement. Inspection of the beam-ends may be done without removing any major parts using the following steps as a guideline.

STEP 1 – If possible, power wash the beam end. As a minimum brush the area with a hard bristle brush to remove road dirt accumulations.

STEP 2 – Chock the front tires to prevent the vehicle from moving. Lift the rear of the vehicle, support the frame on stands so as all the weight is just taken off the suspension, and the beam-ends are off the saddles.

NOTE: All stands and lifting devices **MUST** be of sufficient strength and rigidity to safely support the vehicle. **DO NOT WORK AROUND OR UNDER THE VEHICLE WHEN SUPPORTED ON LIFTING DEVICES**.

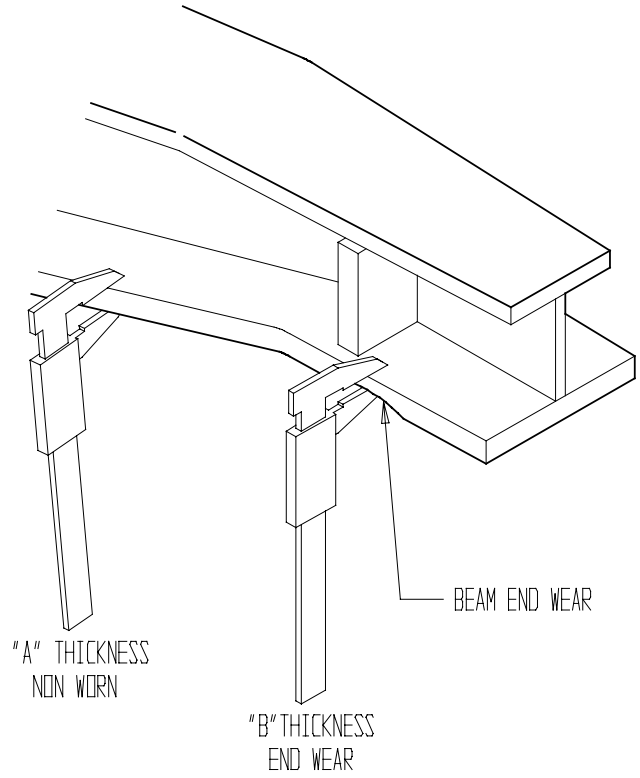
STEP 3 – Manoeuvre the beam so as the wear area thickness on the bottom face, may be determined using either a micrometer or a vernier calliper. Measure the thickness at the wear area, and a non-worn area. See Fig.8. The wear allowance is the difference between thicknesses and MUST not be any greater than .062" (1.5 mm).

NOTE: All measurements should be taken as a minimum of ½" from the beam flange edges to eliminate any edge wear that may have occurred.

If the beams show wear greater than the .062" (1.5 mm) allowable, a Chalmers supplied wear plate **MUST** be installed. Contact Chalmers for details.

NOTICE: Should excessive wear or cracks be found during vehicle operations, it may be **SLOWLY** driven to the nearest repair shop. Failure to repair or replace excessively worn or cracked walking beams will lead to failure of the beam ends and consequent loss of vehicle control.

BEAM WEAR MEASUREMENT



Beam Wear Maximum Limit
"A" Thickness minus "B" Thickness --------.062" (1.5mm) Maximum

FIGURE 8

4.11 WALKING BEAM REPAIR/REPLACEMENT

Repair of the walking beam entails the use of electric arc welding and MUST be performed by a qualified shop. See Appendix "C" Eng. Bulletin 8904 and Appendix "D" Eng. Bulletin 8905 for repair installation instructions and guidelines.

Replacement of the walking beams may be done in any shop without the use of special tools using the following steps as a guide:

STEP 1 – If possible, power wash the walking beam. As a minimum, the beam should be brushed with a hard bristle brush to remove road dirt accumulation.

STEP 2 – Chock the front tires to prevent the vehicle from moving. Remove all drive axle brake or wind up loads by placing transmission in neutral and releasing the spring or driveline brakes.

STEP 3 – Lift the rear of the vehicle. Support the frame on stands so all weight is just taken off the suspension.

NOTE: All stands and lifting devices **MUST** be of sufficient strength and rigidity to safely support the vehicle. **DO NOT WORK AROUND OR UNDER THE VEHICLE WHEN SUPPORTED ON LIFTING DEVICES.**

STEP 4 – Remove the spring plate, spring and restrictor can following Steps 3 and 4 in Section 4.5.

STEP 5 – Remove the upper, and if necessary, the lower torque rod from the rear most axle following Step 4 outlined in Section 4.3.

NOTE: Tag or mark each torque rod so as each rod may be replaced in the exact position it came off.

STEP 6 – Roll the rear axle back so as the beam end is free of the saddle. Raise the free end up and slide the beam back to remove from suspension.

STEP 7 – Install the replacement or repaired beams by sliding the beam-ends into the respective saddles on the front axle. See Fig.9. Roll the rear axle forward and at the same time, slide the rear beam-ends into their respective saddles.

STEP 8 – Replace the rear axle upper and lower torque rods following Step 9 through 11 in Section 4.3.

STEP 9 – Replace the spring plate, spring and restrictor can following Step 6 in Section 4.5.

STEP 10 – Torque all fasteners to values shown in Table 2.

****IMPORTANT: FAILURE TO CHECK TORQUE MAY LEAD TO FASTENER FAILURE AND CONSEQUENT LOSS OF VEHICLE CONTROL AND VOID WARRANTY.**

BEAM INSTALLATION

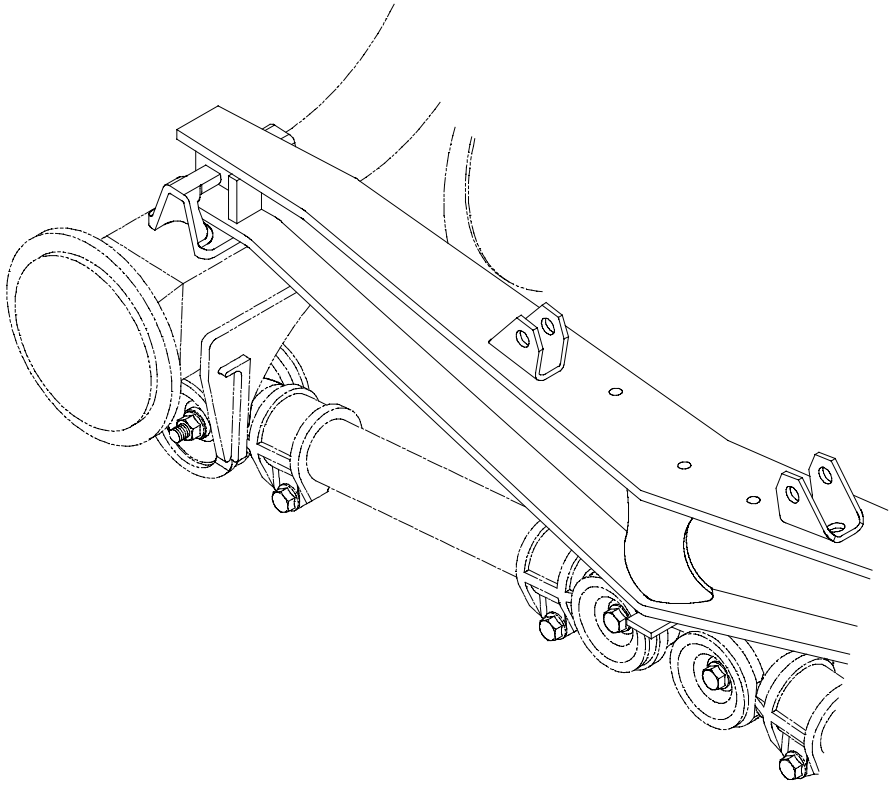


FIGURE 9

4.12 RUBBER SPRING INSPECTION

The Chalmers patented rubber springs used in the 800 Series Suspensions are manufactured to very exacting standards from a high quality natural rubber compound, and in the vast majority of cases will last the life of the vehicle.

The rubber springs are factory matched to the capacity of the suspension to provide the best ride possible. Three sizes are used in the 800 Series and are shown in Table 4.

TABLE 4

CAPACTY	SPRING SIZE	PART NUMBER
36,000 lbs.	#15	15015
40,000 lbs. to 58,000 lbs.	#20	15002
65,000 lbs. to. 100,000 lbs.	#26	15026

Under normal operation, the Chalmers rubber springs do not require periodic maintenance or replacement. Minor scrubbing from the restrictor can and attachment fasteners is normal. The springs also lose a little in overall height due to compression set. This reduction in height occurs in the first few loads, making an in-service spring shorter than a new spring.

To reduce the chances of prematurely replacing a good spring, the following steps should be used when inspecting all Chalmers rubber springs.

STEP 1 – If possible, power wash the restrictor can spring area. As a minimum, brush the area with a hard bristle brush to remove road dirt accumulations.

STEP 2 – Chock the front tires to prevent the vehicle from moving. Lift the rear of the vehicle, support the frame on stands so all the weight is just taken off the suspension.

NOTE: All stands and lifting devices **MUST** be of sufficient strength and rigidity to safely support the vehicle. **DO NOT WORK AROUND OR UNDER THE VEHICLE WHEN SUPPORTED ON LIFTING DEVICES.**

STEP 3 – Rotate the spring completely around, looking at the rubber spring below the restrictor can for deep cuts, severe distortion, and signs of chemical attack leaving the surface sticky or dry cracked.

If severe distortion is noticed, contact Chalmers for details.

NOTICE: Should a damaged spring be found during vehicle operation, it may be driven **SLOWLY** to its maintenance shop for spring replacement. Springs may be replaced in ones; they do not require replacing in sets. Failure to replace a damaged spring may lead to a hard ride or vehicle control problems with consequent vehicle damage.

4.13 RUBBER SPRING REPLACEMENT

Replacement of Chalmers rubber springs may be achieved easily and quickly in any shop, without the use of special tools, using the following steps as a guide.

STEP 1 – If possible, power wash the restrictor can spring area. As a minimum, brush the area with a hard bristle brush to remove road dirt accumulations.

STEP 2 – Chock the front tires to prevent the vehicle from moving. Lift the rear of the vehicle, support the frame on stands so all weight is just taken off the suspension.

NOTE: All stands and lifting devices **MUST** be of sufficient strength and rigidity to safely support the vehicle. **DO NOT WORK AROUND OR UNDER THE VEHICLE WHEN SUPPORTED ON LIFTING DEVICES.**

STEP 3 – Remove the two 3/8” NC fasteners holding the lower spring plate to the beam. Discard the fasteners. Pull the lower spring plate, spring and restrictor can, as one assembly outward off the beam. See Fig.5.
NOTE: On 54.0” spread suspensions, it may be necessary to remove either the front or rear tires to allow spring assembly removal.

STEP 4 – Separate the restrictor can, spring and lower spring plate. Discard the rubber spring. Using a wire brush or scraper clean all rust, scale and road dirt accumulations from the spring plate. Clean out the centre vent holes in the beam and lower spring. See Fig.5. Inspect the lower spring plate for visual cracks. If cracked, replace. Contact Chalmers for details.

STEP 5 – Place the new spring on the lower spring plate, inserting the spring dowel into the centre spring hole. Place the restrictor can over the spring. Make sure the can centre locator is in the centre spring hole. See Fig.5.

STEP 6 – Lift and place, as one assembly, the lower spring plate, spring and restrictor can onto the beam. Line up the two 3/8" fastener holes.

STEP 7 – Install and tighten the new 3/8"' NC spring plate fasteners. Torque to 35 ft. lbs. See Table 2.

5.0 AXLE ALIGNMENT

The 800 Series Tandem Suspension uses four torque rods for each axle. These torque rods are the ONLY parts in the suspension that affect the location or alignment of each axle.

The four (2 per axle) top vee torque rods, set the axle spread, side to side centre and axle operating planning angle. They are factory set and play NO part in the alignment process. See Fig.4.

The four (2 per axle) bottom torque rods set the axle spread, axle operating angle, and axle alignment. These rods are the ONLY means of making periodic adjustments for axle alignments. See Fig.4.

The Chalmers 800 Series Suspension allows for the precision alignment of each axle by the use of fine threads cut into the bottom torque rod tubes. These rods incorporate left and right hand cut threads on the same tube, thus by rotating the tube, the rod length may be increased or decreased (within the limit of the rod) to achieve the desired alignment.

To accommodate all suspension capacities, Chalmers uses two sizes of torque rods and tubes. See Table 5 and Fig.11.

TABLE 5

CAPACITY	TORQUE ROD SIZE	DIAMETER
36,000 lbs. to 40,000 lbs.	#1	2-3/8" Outside Dia.
46,000 lbs. to 58,000 lbs.	#2	2-7/8" Outside Dia.

5.1 AXLE MEASUREMENT

Measurement and alignment of a vehicle fitted with a Chalmers 800 Series Tandem Suspension may be done with any of the commercially available alignment systems. If this type of specialized equipment is not available, alignment may be carried out using a tape measure and plumb bob.

No matter which method is used, due to the compressible design of the Chalmers rubber torque rod bushing, ALL measurements and adjustments MUST be made with the bushings in a neutral, fully relaxed state. Any compression remaining in the suspension will result in false readings or measurements and will lead to a misalignment being carried out. To reduce the chances of this happening, the following steps should be carried out prior to measurement and/or alignment.

STEP 1 – To remove any cornering compression, either drive the vehicle back and forth a few times or, if this is not possible, lift the rear of the vehicle so all the load is just off the suspension. Hold for a few minutes, and then lower down. **Do not set park brake.**

DO NOT AT ANY TIME WORK AROUND OR UNDER A VEHICLE SUPPORTED ONLY ON LIFTING DEVICES. THE VEHICLE MUST BE SECURELY CHOCKED AND SUPPORTED ON RIGID STANDS BEFORE WORK MAY COMMENCE.

STEP 2 – Chock the front tires to prevent the vehicle from moving. Remove all drive axle loads by placing transmission in neutral and releasing the spring or driveline brakes.

STEP 3 – Using a relevant alignment system and following all the manufacturers operating and safety instructions, take measurements of the axle alignment. Compare these to the vehicle manufacturers specification. If none are available, the following may be used as a guide:

For Hunter type equipment - .08 deg. Max thrust angle.

Rear axle for Bee Line type equipment - ±3/8 off centre (290" from target)
- ±1/4 off centre (190" from target)

The front rear and rear rear axle must **"TRAM "** to ±1/16" side-to-side.

STEP 4 – Use only when no alignment systems are available.

Locate the grease fitting on the FRONT spring eye pin (steering axle). Attach a plumb bob to this fitting so the point is just above the floor. Mark the floor right under the bob point. Repeat this procedure for the other pin. This now gives two fixed measuring points that are referenced off the vehicle frame. See Fig.10.

NOTE: Make sure to wrap the plumb bob string in the same direction on both grease fittings (ensuring that the plumb bob string hangs in an identical manner on both sides).

With a good quality tape, measure the distance from the front axle floor fixed points to the front flange on the torque rod axle brackets. See Fig.10. Repeat for other side.

Now do side-to-side axle "TRAM". Compare these dimensions. For the axles to be in alignment ALL of the dimensions MUST be within ±1/16". See Fig.10.

AXLE ALIGNMENT (NO ALIGNMENT SYSTEM)

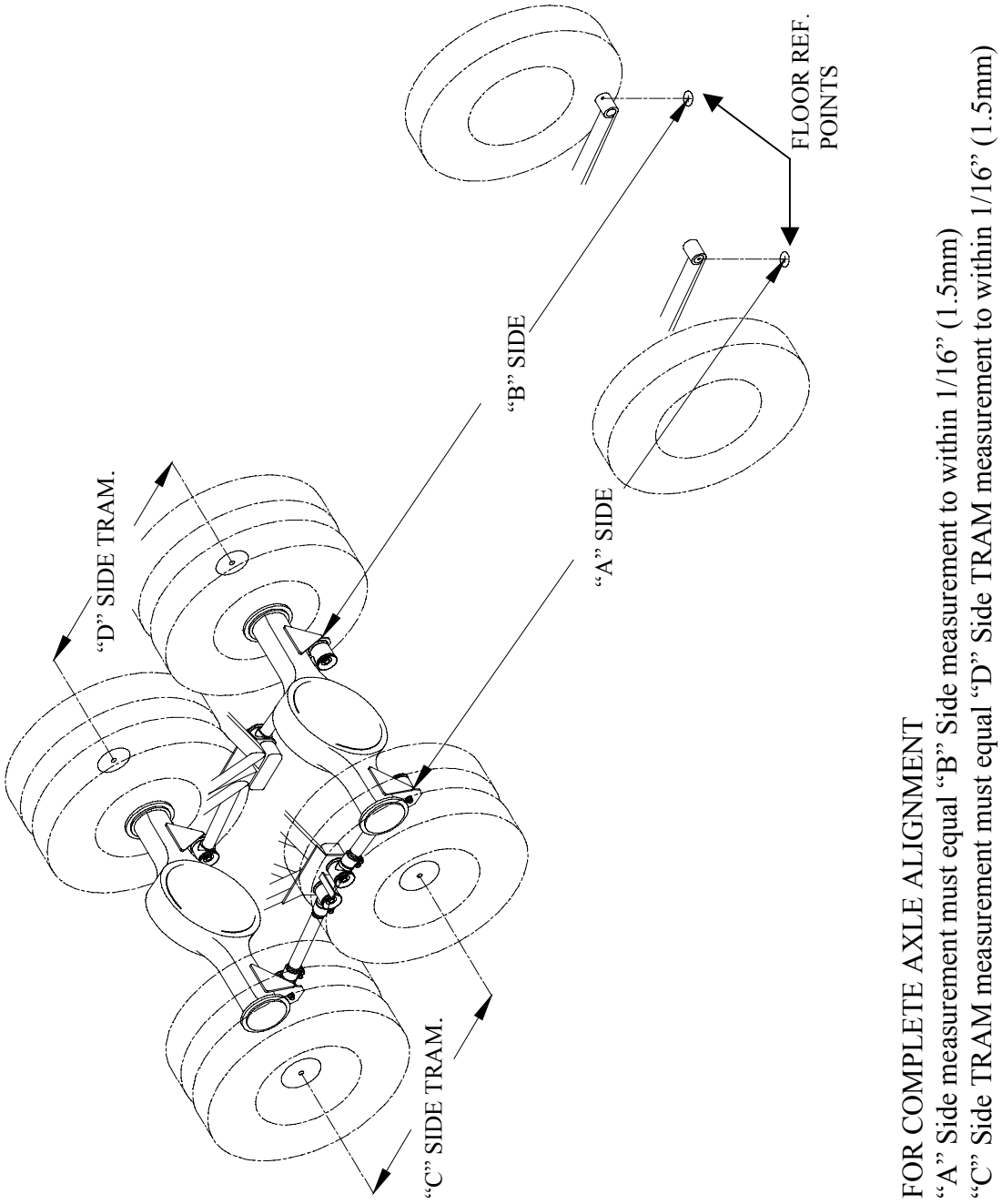

FLOOR REF. POINTS
"B" SIDE
"A" SIDE
"D" SIDE TRAM.
"C" SIDE TRAM.
FOR COMPLETE AXLE ALIGNMENT
"A" Side measurement must equal "B" Side measurement to within 1/16" (1.5mm)
"C" Side TRAM measurement must equal "D" Side TRAM measurement to within 1/16" (1.5mm)

FIGURE 10

5.2 AXLE ALIGNMENT ADJUSTMENTS

Should the results of Step 3 or 4 from Section 5.1 show that the axles are not within either the vehicle manufacturers specifications or the Chalmers recommended guidelines, an axle adjustment will be required. This may be done without the use of any special tools using the following steps as a guide.

STEP 1 – If the vehicle has been moved after measurement, then the bushings MUST be neutralized, and if a tape measurement is to be used, reference points marked. See Section 5.1, Steps 1 through 4.

STEP 2 – Working on the axle to be adjusted and on ONLY ONE torque rod at a time, loosen the lower torque rod eye pinch bolts (both ends). See Fig.11.

NOTE: If the pinch bolt fasteners are badly corroded or damaged, replace with NEW hardware.

STEP 3 – Attach a pipe wrench to the torque rod tube. (A chain type wrench preferred). Rotate this tube to either lengthen or shorten the torque rod. Continue this process until the axle is within alignment specification referred to in Section 5.1, Steps 3 or 4.

NOTE: If difficulty is encountered rotating the tube, the threaded ends may have become corroded. Apply a quality penetrating oil to the threads. If difficulty is still encountered, wedges may be driven between the eye lugs to remove the clamp effect.

Before retightening the torque rod pinch bolts, visually check the rubber bushings. They should appear even around the eye with NO distortion. If distortion is seen, neutralize the bushing and re-measure.

STEP 4 – Tighten and torque the eye pinch bolts. If the bolts are corroded or damaged, replace with NEW fasteners. See Fig.11.

Torque 1/2" NC fasteners to 65 ft. lbs.

Torque 5/8" NC fasteners to 135 ft. lbs.

See Table 2 and Appendix "D" Service Bulletin No.26.

STEP 5 – Repeat Steps 1 through 3 to complete alignment.

STEP 6 – Torque ALL fasteners to values shown on Table 2.

IMPORTANT: FAILURE TO CHECK TORQUE MAY LEAD TO FASTENER FAILURE AND CONSEQUENT LOSS OF VEHICLE CONTROL AND VOID WARRANTY.

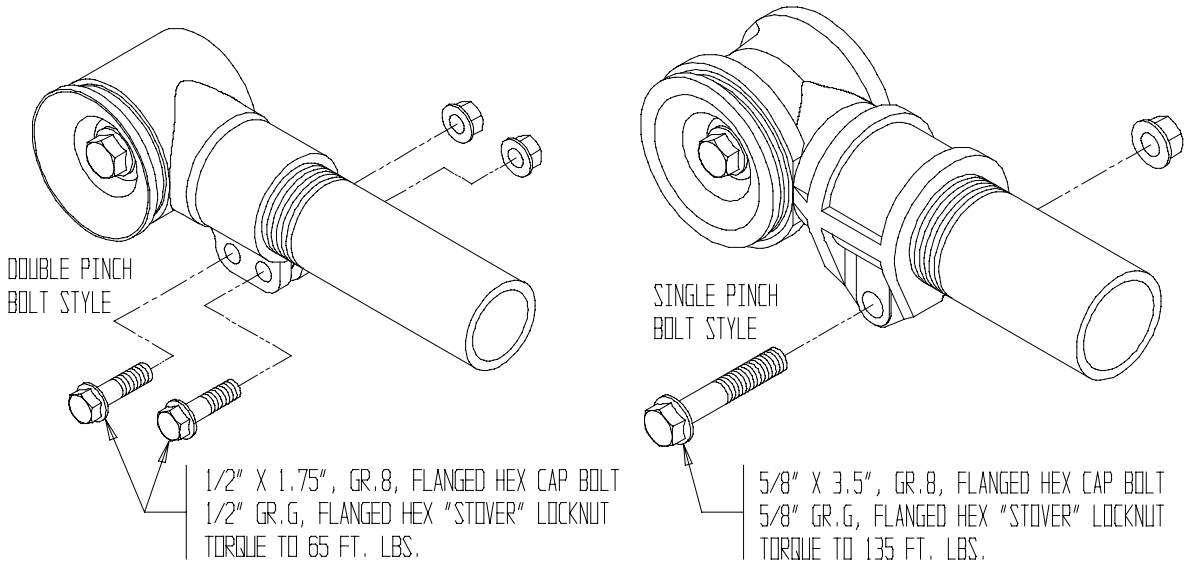

DOUBLE PINCH
BOLT STYLE
1/2" X 1.75", GR.8, FLANGED HEX CAP BOLT
1/2" GR.G, FLANGED HEX "STOVER" LOCKNUT
TORQUE TO 65 FT. LBS.
SINGLE PINCH
BOLT STYLE
5/8" X 3.5", GR.8, FLANGED HEX CAP BOLT
5/8" GR.G, FLANGED HEX "STOVER" LOCKNUT
TORQUE TO 135 FT. LBS.

FIGURE 11

6.0 TROUBLE SHOOTING

PROBLEM	POSSIBLE CAUSE AND CORRECTION
Loose Spigot Caps	**(Fasteners Not Torqued Properly)** Re-torque to 135 ft. lbs. And re-check at 1,600 km/1,000 miles. If repeated loosening occurs, replace fasteners & spigot cap if required. Torque to 135 ft. lbs. And re-check at 1,600 km/1,000 miles. See Sections 4.6 & 4.7.
Prematurely Loose or Worn Bushings	**(Chemical Attack, Petroleum Products or Worn Bushings Used in Installation or Cleaning)** Remove all traces of petroleum products and re-bush. See Sections 4.2 & 4.3. **(Hard Part Wear)** Re-Bush using oversize bushings, see Sections 4.2 & 4.3. **(Spigot Cap and/or Fasteners Loose)** Re-Bush and torque check to 135 ft. lbs. See Sections 4.2, 4.3 & Table 2.
Adjustable Torque Rod Tube Pull Out or Back Off.	**(Eye Pinch Bolts Not Torqued Properly)** Replace torque rod and torque check pinch bolts. See Table 2.
Walking Beam Touching Triangular Frame.	**(Worn or Loose Upper Torque Rod Bushings)** Re-Bush upper torque rods. See Sections 4.2 & 4.3.
Premature Beam End Wear	**(Wet Highly Abrasive Road Conditions)** Add wear pads to beam or replace beam. See Sections 4.10 & 4.11.
Excessive Tire Wear	**(Axles Out of Align)** Re-Align. See Sections 5.1 & 5.2. **(Tire Pressure)** Check tire pressure and inflate to manufactures specification.
Excessive Axle Movement	**(Worn Bushings)** Re-Bush. See Sections 4.2 & 4.3 **(Adjustable Torque Rod Pull Out)** Replace torque rod and torque check pinch bolts. See Table 2.
Excessive Wheel Bounce or Hop	**(Worn or Broken Shocks)** Replace shocks. See Sections 4.8 & 4.9. **(No Shocks Fitted)** Install shock kit. **(Tire Pressure)** Check tire pressure, balance, and inflate to manufacturers specifications.
Excessive Vehicle Bounce Unladen	**(Worn or Broken Shocks)** Replace shocks. See Sections 4.4 & 4.5. **(No Shocks Fitted)** Install shock kit.

PROBLEM	POSSIBLE CAUSE AND CORRECTION
Vehicle Does Not Sit Level	**(Broken or Missing Restrictor Can)** Replace both restrictor cans. See Sections 4.4. & 4.5. **(Damaged Spring)** Replace spring. See Sections 4.12 & 4.13. **(Damaged Walking Beam)** Replace walking beam. See Sections 4.11. **(In a New Vehicle High/Low Beam Installation Problem)** Replace incorrect beam.
Vehicle Unstable Rolls	**(Requires High Stability Restrictor Can)** Use restrictor can# 373029. (Optional) Replace both. **(Broken or Missing Restrictor Can)** Replace both restrictor cans. See Sections 4.4 & 4.5. **(Damaged Spring)** Replace spring. See Sections 4.12 & 4.13.
Vehicles Rides Excessively Hard	**(Tire Pressure)** Check tire pressure and inflate to manufacturers specifications. **(Damaged Spring)** Replace spring. See Sections 4.12. & 4.13 **(Insufficient Clearance Between Beam Stop and Beam)** Replace with correct length stop. **(Broken or Missing Shocks)** Replace shock or install shock kit. See Sections 4.8 & 4.9.
Vehicle Handles Poorly	**(Tire Pressure)** Check tire pressure and inflate to manufacturers specification. **(Axles Out of Align)** Re-align. See Sections 5.1 5.2. **(Worn Bushings)** Re-bush. See Sections 4.2 & 4.3 (**Broken or Missing Shocks)** Replace shocks or install shock kit. See Sections 4.8 & 4.9. **(Broken or Missing Restrictor Can)** Replace both restrictor cans. See Sections 4.4 & 4.5. **(Damaged Spring)** Replace spring. See Sections 4.12 & 4.13. **(Insufficient Beam Stop/Beam Clearance)** Replace with correct length stop.

TABLE 6 **SPIGOT WEAR LIMITS**

ITEM	PART NO.	SPIGOT	WEAR LIMIT FOR STANDARD BUSHING	WEAR LIMIT FOR OVERSIZE BUSHING
1	800021	Spigot #2	2.530" Min. 800010 Bushing	2.530" Max / 2.500" Min. 800009* Bushing
7	800200	Spigot #1	2.350" Min. 22128 Bushing	2.350" Max / 2.300" Min. 22129* Bushing
4	700096	Spigot #0	2.350" Min. 22128 Bushing	2.350" Max / 2.320" Min. 22129* Bushing

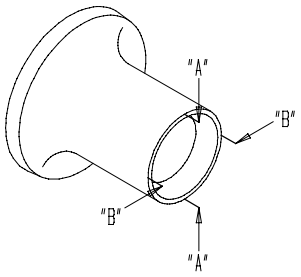
*SERVICE BUSHING

WEAR MEASUREMENT

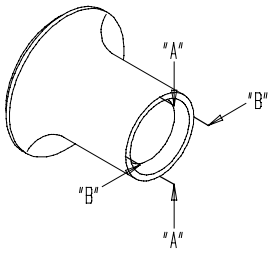
To determine wear take two measurements 90 deg. apart "A-A" and "B-B" as shown, or measure over visible wear area.

The smaller of the two dimensions is to be taken as the wear limit. See Table 6 for values.

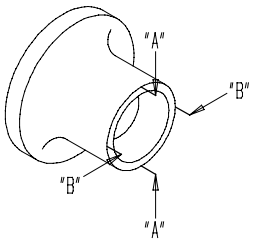
NOTE: If spigot is below min. dimension shown in Oversize Table, contact Chalmers for guidelines.



#2 Joint
800 Series Tandem Truck 46,000 to 58,000 lbs Capacity



#1 Joint
800 Series Tandem Truck 40,000 lbs Capacity – after Jan 1/93

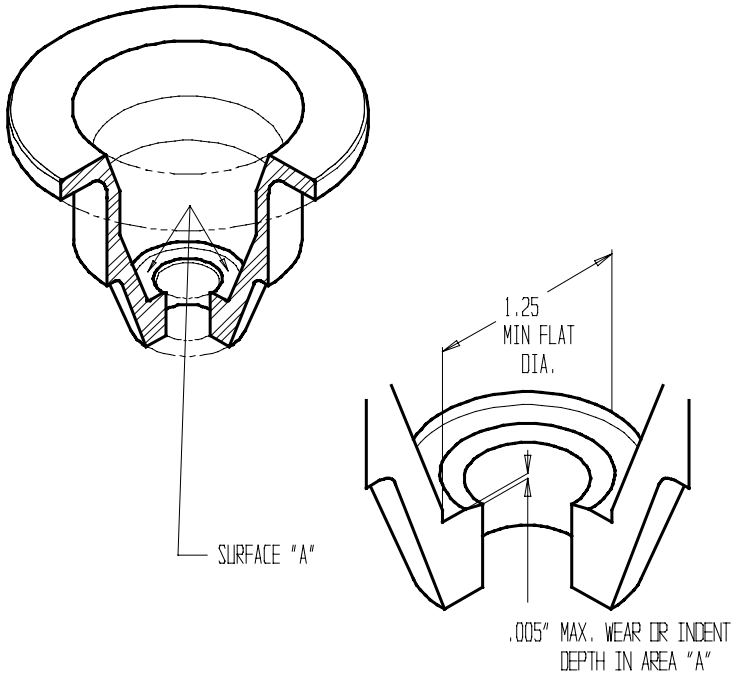


#0 Joint
800 Series Tandem Truck 40,000 lbs Capacity – before Jan 1/93

APPENDIX "A"

SERVICE BULLETIN RE: PART NO. 260002

IMPORTANT: Inspect (Part No. 260002) when: rebushing, installing new hardware or when repeated loosening of the hardware occurs.



To Inspect:

Remove cap from joint, remove all dirt, rust, oil and grease from bolt head contact area, surface "A".

Inspect surface "A".

The surface must be flat, to a diameter 1.25" min.

No wear or indent deeper than .005" is allowed in this area.

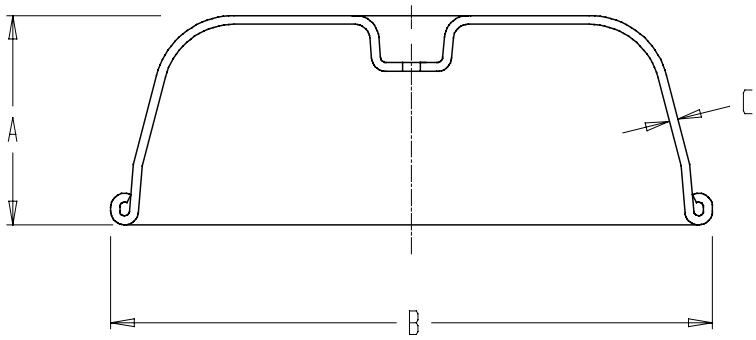
IF THE CAP DOES NOT MEET THE ABOVE GUIDELINES, IT MUST BE REPLACED.

FAILURE TO DO SO MAY CAUSE SEPARTION OF THE JOINT, LEADING TO LOSS OF CONTROL OF THE VEHICLE.

APPENDIX "B"

TECHNICAL SALES BULLETIN No.15

Restrictor Can Available and Application Chart



TRUCK SUSPENSION MODEL

Restrictor Can#	Part No.	A	B	C	Usage by Model/Capacity	Standard Optional	Comments
15	373015	4.38"	11.19"	0.125"	800-XX Series 36,000 lbs. only	Std.	Tandem Axle
28	373028	4.44"	12.63"	0.173"	800-XX Series All Capacities	Std.	Tandem Axle
29	373029	5.17"	11.64"	0.173"	800-XX Series All Capacities	Optional	Tandem Axle High C of G, (i.e. concrete mixer, logger)

APPENDIX "C"

ENGINEERING BULLETIN 8904

WEAR PLATE INSTALLATION

Chalmers Suspension Walking Beam

1. Read all safety notes in Section 2.0 of Engineering Bulletin #8905.

2. Prior to any installation work, support the vehicle on stands, apply brakes and block wheels.

3. Prior to any welding, read all general notes and welding processes in Sections 3.0, 4.0, 5.0 & 6.0 of Engineering Bulletin #8905.

4. Remove both beams from the suspension, clean and inspect.

5. Inspect beams as per Section 7.5 of Engineering Bulletin #8905.

6. Clamp wear plate #700313 to bottom flange of beam. Make sure plate is located centrally on flange and is a good profile fit to flange. If required, slightly grind to obtain this.

7. Tack weld plate to flange. Tack on sides only.

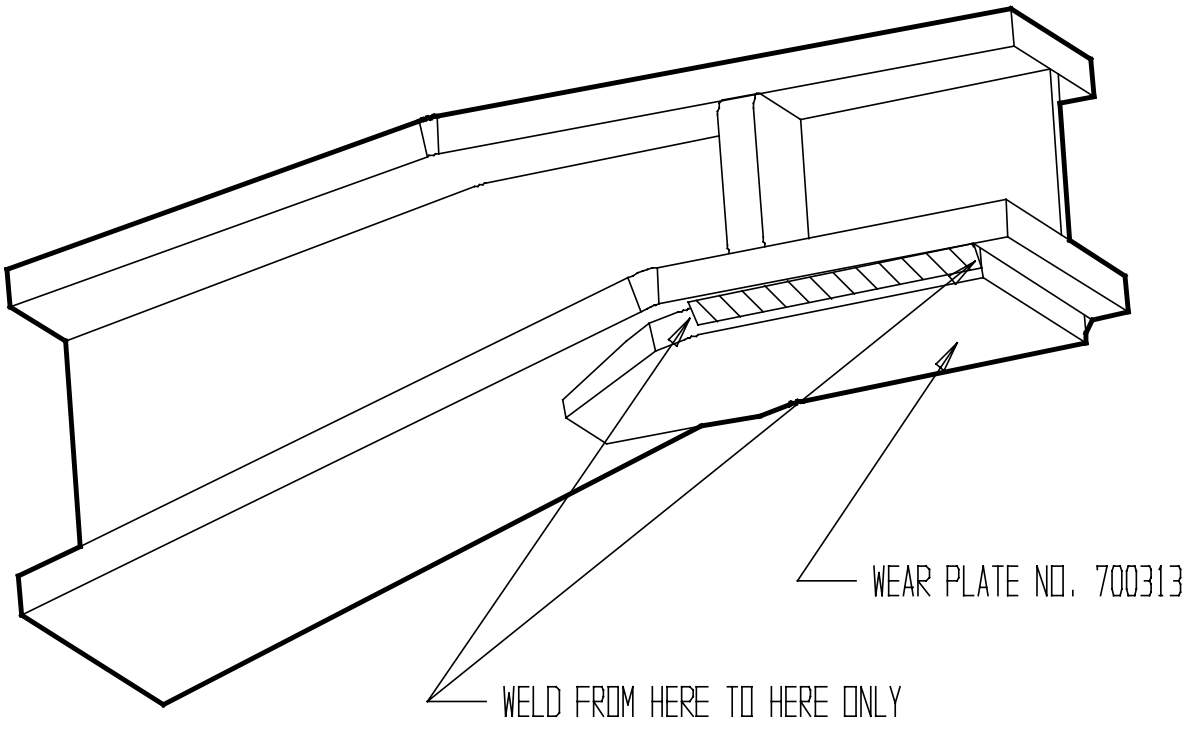
8. Remove clamps. Weld plate to flange as shown building weld to 1/4"" minimum 5/16" maximum fillet.

   CAUTION: Do not weld at either end of the wear plate.

9. Prime and paint reworked area.

10. Reinstall beam into suspension. Check all bolts for correct torque.
    See Technical Service Bulletin #8018.

11. Remove all stands and wheel blocks.



WELD 1/4" MIN., 5/16" MAX. FILLET

APPENDIX "D"

ENGINEERING BULLETIN 8905

REPAIR & WELD INSTRUCTIONS
Walking Beam Ends

1.0 Scope:

1.1 This procedure shall be used when repairing and welding Chalmers Suspensions International Inc. walking beam-ends.

2.0 Safety:

2.1 The following safety instructions must be read and followed. Failure to do so could lead to serious injury or possible loss of life.
2.2 Prior to any work commencing on the vehicle, the cargo compartments and delivery systems must contain a non-explosive and non-toxic atmosphere.
2.3 Any stands or jacks used to support or lift the vehicle must be of sufficient capacity to do so with adequate safety margins. Do not work under the vehicle when supported by jacks only.
2.4 All welding equipment and power tools must be used in and according to the manufacturer's safety and operating instructions.

3.0 General Instructions:

3.1 MATERIAL CLEANING – all material shall be free from loose scale, slag, oil, rust and other foreign material.

3.2 JOINT PREPARATION – joint surfaces shall be free from loose scale and rust. Burned surfaces shall be smooth within 1/32".

3.3 TACK WELD – use appropriate size electrode and same type as specified below. Employ corresponding weld data from chart below.

3.4 PREHEAT weld joint area as specified in 4.0.

3.5 CLEAN all slag and spatter between passes.

4.0 Welding Process(es):

4.1 USE REVERSE POLARITY – electrode positive.
4.2 WELDING SPEED shown is the ABSOLUTE MINIMUM. DO NOT WELD SLOWER.
4.3 THICKNESS in between those specified on the chart, use data from column of next smaller weld size.

4.4 MANUAL SHIELDED ARC PROCESS:

Thickness	1/4”	3/8”
Type Electrode	7018	7018
Size	1/8”	1/8”
Amperage	130	130
Voltage	22	22
Weld Speed I.P.M.	9	6

Preheat to room temperature, 70 – 110 deg.F.
Number of passes depends on type and size of joint.

4.5 METAL – INERT GAS PROCESS:

Thickness	1/4”	3/8”
Type Electrode	E70T1	E70T1
Size	1/16”	5/64”
Amperage	250	350
Voltage	28	26
Weld Speed I.P.M.	20	19

Preheat to room temperature, 70-100 deg. F.
Number of passes depends on size of joint.

4.6 ELECTRODE WIRE – use E70T1 electrode wire or equivalent.

4.7 COVER GAS – use welding grade C02 cover gas (Minimum Dew Point – 50), or 95Ar-5C02.

4.8 REGULAR SETTING – 35-48 cu.ft. per hour.

5.0 Welding Sequence:

5.1 PREHEAT to temperature as specified in Section 4.0.

5.2 CHIP AND BRUSH all slag and spatter between passes, grind out all defects.

6.0 Inspection:

6.1 Visually inspect every completed row.

7.0 Repair:

7.1 Prior to any repair work, read all safety notes in Section 2.0.

7.2 Prior to any installation, support the vehicle on stands, apply brakes and block wheels.

7.3 Prior to any welding, read all general notes and welding process in Sections 3.0, 4.0, 5.0 and 6.0.

7.4 Remove both beams from the suspension; clean and inspect.

7.5 Inspect beam-ends for cracks. Only cracks in or through the web and stop plate may be repaired. Any cracks that propagate into or through the flanges may not be repaired and the beam must be replaced. See Fig.1.

7.6 Check the bottom flange of the beams to be repaired. If a beam does not have wear plates #700313 attached, install them at this point. See Technical Service Bulletin #8904.

7.7 Grind or air-arc out the crack areas. Do not cut into the flanges.

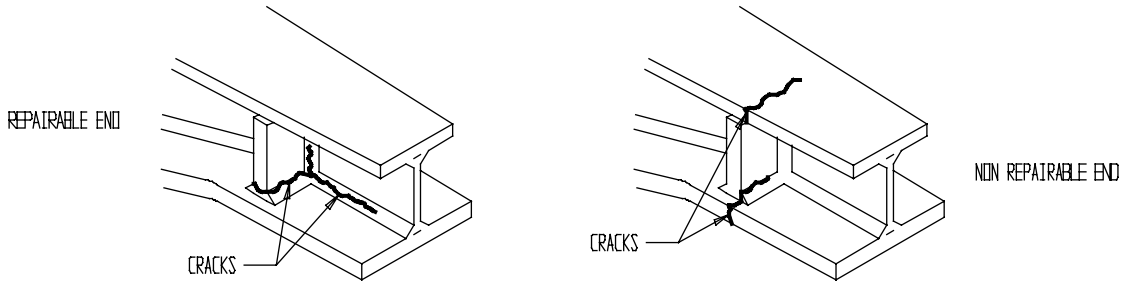
7.8 Reweld beam end web and stop plates. Build welds to ¼" minimum, 5/16" maximum fillets.

7.9 Clamp 3/8" x 1-7/8"x3-1/2" end web reinforcement plate to end web (it may be necessary to grind the plate to obtain a good fit to end webs). Tack weld in place. Remove clamp and finish weld, building weld to ¼" minimum, 5/16" maximum fillet.

7.10 Prime and repaint reworked areas.

7.11 Reinstall beams into suspensions. Check all bolts for correct torque. See Technical Service Bulletin #8018.

7.12 Remove all stands and wheel blocks.



APPENDIX "E"

TECHNICAL SERVICE BULLETIN No.26

Subject: Adjustable Torque Rod – Part No. 216XXX
"0" Torque Rod End with Two Pinch Bolts

IMPORTANT

Failure to follow these instructions may result in separation of the torque rod during operation of the vehicle. This may cause loss of control and vehicle crash.

The subject torque rods use two (2) pinch bolts to secure the torque rod end to the tube (see Fig.1). These bolts must be tightened sequentially until proper torque value is obtained on both bolts. It is recommended that 1/2" NC phosphate and oil grade 8 bolts and type "G" Stover nuts be used. When Chalmers hardware is used the correct torque specification is 65 ft. lbs.

If the torque rods have been operated in a loose condition, the threads may be worn such that clamp load cannot be restored by retorquing the bolts and nuts. A method of determining if adequate clamp load has been maintained it so measure the gap at the torque rod as shown in Fig.2. If the gap is .150" or less, the torque rod has sufficient clamping load. If the gap is between .150" and .170" we recommend that the hardware be replaced and tightened to the correct torque specification. If the gap is over .170" the bolts should be removed, the pinch tabs separated using a chisel as a wedge and inspected for wear. If a visible raised portion of the thread is evident in the area along the gap, the tube has been worn and should be replaced. If there is no evidence of wear, replace the hardware and tighten to the correct torque specification.

All Chalmers fasteners must be final hand torqued to specifications on initial assembly. Retorque is required after initial 1,000 miles (1,600 km) in service. Retorque within 12 months.

APPENDIX "E"

TECHNICAL SERVICE BULLETIN No.26

Part No. Information

Adjustable Torque Rod Tube – 219 XX X
- Length in 1/8 of an inch
- Length in inches

Adjustable Torque Rod End – RH Thread 22045
Adjustable Torque Rod End – LH Thread 22046
Pinch Bolt – 1/2" x 1.75" NC Gr8 Phos & Oil – Hardware 397
Locknut – 1/2" NC GrG – Hardware 393
Adjustable Torque Rod – 216 XX X
- Length in 1/8 of an inch
- Length in inches

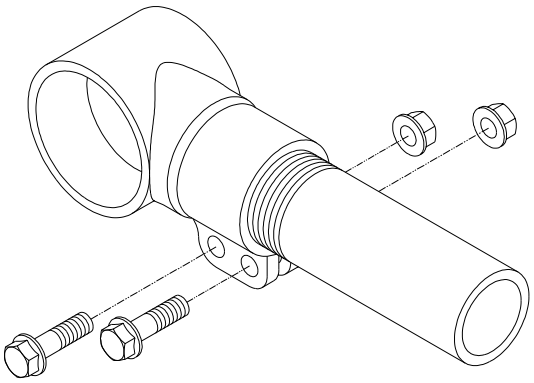


FIGURE 1

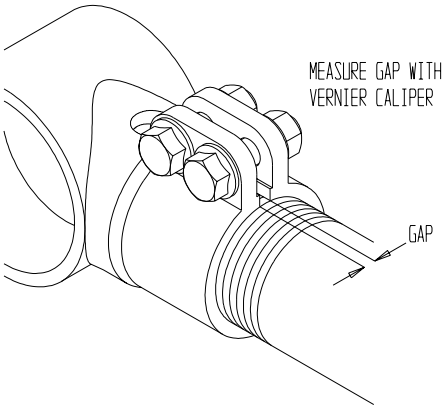


FIGURE 2

APPENDIX "F"

TECHNICAL SERVICE BULLETIN No.31

Subject: Repair and welding instructions for all Chalmers walking beam centre reinforcement compression gussets.

1.0 **Scope:** This procedure shall be used when repairing and welding Chalmers Suspensions International Inc. walking beam centre reinforcement compression gusset attachment fillet welds.

2.0 **Safety:**

2.1 The following safety instructions must be read and followed. Failure to do so could lead to serious injury or possible loss of life.

2.2 Prior to any work commencing on the vehicle, the cargo compartments and delivery systems must contain a non-explosive and non-toxic atmosphere.

2.3 Any stands or jacks used to support or lift the vehicle must be of sufficient capacity to do so with adequate safety margins. Do not work under the vehicle when supported by jacks only.

2.4 All welding equipment and power tools must be used in and according to the manufacturer's safety and operating instructions.

3.0 **General Instructions**:

3.1 MATERIAL CLEANING-all material shall be free from loose scale, slag, oil, rush and other foreign material.

3.2 JOINT PREPARATION-joint surfaces shall be free from loose scale and rust. Burned surfaces shall be smooth within 1/32".

3.3 TACK WELD-use appropriate size electrode and same type as specified below. Employ corresponding weld data from chart below.

3.4 PREHEAT weld joint area as specified in 4.0

3.5 CLEAN all slag and spatter between passes.

4.0 **Welding process**:

4.1 USE REVERSE POLARITY-electrode positive.

4.2 WELDING SPEED shown is the ABSOLUTE MINIMUM. DO NOT WELD SLOWER.

4.3 THICKNESS in between those specified on the chart, use data from column of next smaller weld size.

4.4 MANUAL SHIELDED ARC PROCESS:

Thickness		¼"	3/8"
Electrode	Type	7018	7018
	Size	1/8"	1/8"
Amperage		130	130
Voltage		22	22
Weld Speed I.P.M.		9	6

Preheat to room temperature, 70-110 deg.F.
Number of passes depends on type and size of joint.

5.0 **Repair:**

6.0 Prior to any repair work read all safety notes in Section 2.0

7.0 Prior to any repair work support the vehicle on stands, apply brake and block front wheels.

5.3 Prior to any welding, read all general notes and welding processes in Section 3.0 and 4.0.

5.4 Remove both beams from the suspension see Section 4.11 of the 800 Series Service and Maintenance Manual for guidelines; clean and inspect both beams.

5.5 Inspect the fillet welds on the bottom, top and sides of the two centre reinforcement compression gussets. Only cracks in or through the weld fillets may be repaired. Any cracks that propagate into or through the beam: flanges top or bottom: or web plates are not to be repaired and the beam must be replaced. See Fig.1.

5.6 Grind out the crack areas; remove as much of the old fillet weld as possible. Do not cut into the flanges or web.

5.7 Re-weld ground out fillet, build fillet weld to ¼" minimum, 5/16" maximum and weld part number 800599 over existing plate as shown in Fig.2.

5.8 Prime and repaint reworked areas.

5.9 Reinstall beams into the suspension. See Section 4.11 of the 800 Series Service and Maintenance Manual for guidelines.

5.10 Check all bolts for correct torque. See Section 4.1 Table 2 of the 800 Series Service and Maintenance manual for the correct torque specifications.

5.11 Remove all stands and wheel blocks.

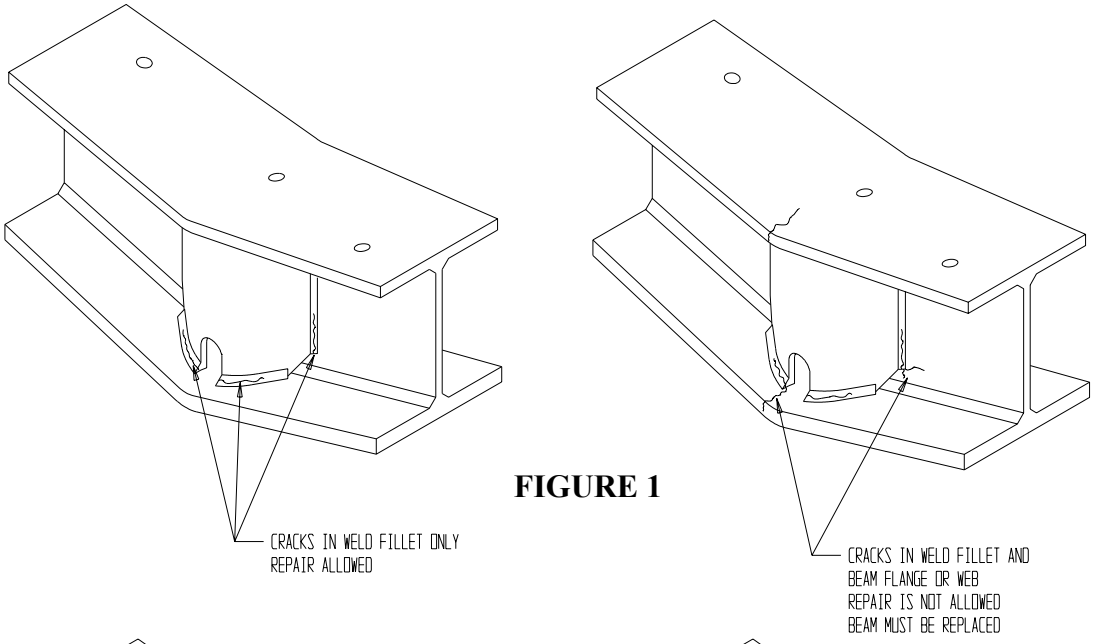

CRACKS IN WELD FILLET ONLY
REPAIR ALLOWED
CRACKS IN WELD FILLET AND
BEAM FLANGE OR WEB
REPAIR IS NOT ALLOWED
BEAM MUST BE REPLACED

FIGURE 1

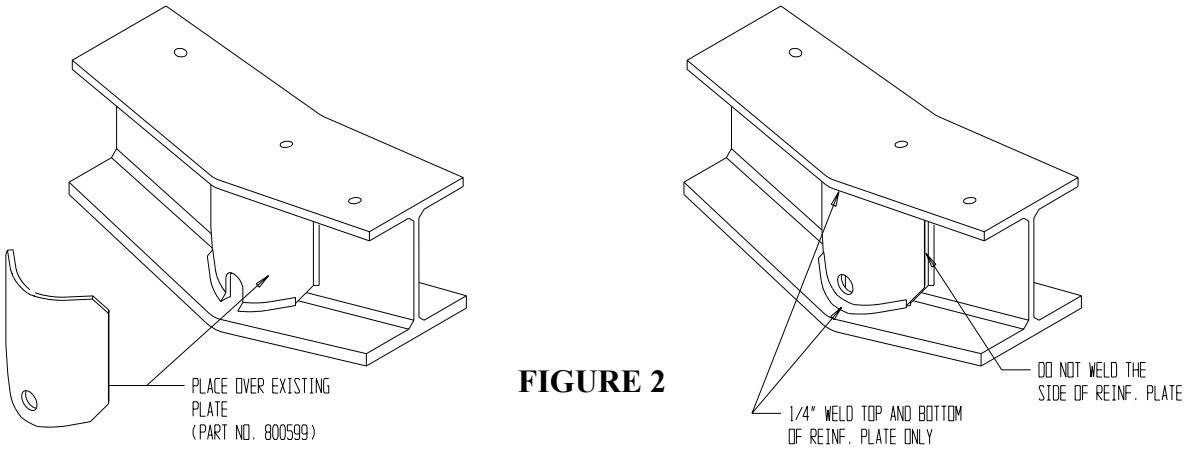


FIGURE 2